Table A-1. Database of Potential Sources for Earthquakes Larger Than M6 in Northern California (simplified)

code	**fault** or **source name**	M_w	t_e effective recurrence time, yr	seismic moment rate, 10^{15} Nm/yr	**r** slip rate mm/yr	±	**d** slip m	**l** length km	**w** km	h_t* km	dip °	fault type †	method ‡	summary
A1	**San Andreas, 1906 rupture**	**7.9**	**210**	3700	**24**	3	4.4	470	13	0	90	RL	2	Slip rate after: *Niemi and Hall* [1992]; *Prentice and others* [1991], north of Golden Gate. Average slip in 1906 north of Golden Gate was 5-6 m [*Thatcher and others,* 1997] Lower slip, 2-4 m, south of Golden Gate
A2	**San Andreas, Peninsula-independent**	**7.1**	**400**	150	**17**	3	1.6	88	14	0	90	RL	2	Segment between 1989 rupture and 2-km right step at Golden Gate [*Cooper*, 1973], where 1906 slip dropped 5-6 m to 2-3 m [*Thatcher and others*, 1997] Recurrence in text. Rate limits: local [*Hall and others*, 1995], regional [*Lienkaemper and others*, 1991]
A3	**San Andreas, Santa Cruz Mts -indep.**	**7.0**	**400**	80	**14**	3	1.6	37	18	0	90	RL	2	Patch size after *Lisowski and others* [1990], but use 90° dip as more characteristic of right-lateral events. Slip rate 17 mm/yr [*Lienkaemper and others*, 1991] less 3 mm/yr on Sargent fault. Balances recurrence of great SAF and San Gregorio fault events
A4	**San Gregorio**	**7.3**	**400**	290	**5**	2	2.0	129	15	0	90	R-RL	1	Preliminary rates: 3-9 mm/yr, Año Nuevo [*Weber and Nolan*, 1995] ; Seal Cove, >5mm/yr (14 ka), <4.5 mm/yr (~85 ka [G. D. Simpson and others, W. R. Lettis & Assocs., 1995, writ. com.] SE-end, 2-3 km right stepover. Reverse slip <1 mm/yr [*Anderson and Menking*, 1994]
A5	**San Gregorio, Sur region**	**7.0**	**400**	86	**3**	1.5	1.2	79	12	0	90	R-RL	1	Slip rates from San Simeon and Hosgri faults to southeast. Latest Quaternary geologic rate >1-3 mm/yr [*Hanson and Lettis*, 1994; *Hall and others*, 1994] and <6-9 mm/yr *Weber* [1981] VLBI rate of broad zone 3.1 ± 0.8 mm/yr [Feigl and others, 1993]
A6	**Sargent**	**6.8**	**330**	57	**3**	1.5	1.0	53	12	0	90	R-RL	1	Creep rate is 3 mm/yr [*Prescott and Burford*, 1976] over southern ~1/3 of fault; northern 2/3 converges with San Andreas fault at depth thus may not be independent source of earthquakes
A7	**San Andreas, creeping zone**	**--**	**0**	0	**34**	5	0.0	124	12	0	90	RL	-	Creep releases most strain. No M>6 events observed historically between Parkfield and San Juan Bautista (T. Toppozada, oral communication, 1996). Possible M>6 covered as background, not as discrete sources
H1	**Hayward, south**	**6.9**	**210**	140	**9**	2	1.9	43	12	0	90	RL	2	Uniform model of south segment, not 1868 event, see text. Slip from *Yu and Segall* [1996]; slip rate of *Lienkaemper and Borchardt* [1996]
H1a	**Hayward, Southeast Extension**	**6.4**	**220**	23	**3**	2	0.7	26	10	0	90	R-RL	1	Right-lateral slip rate limited by high rates on adjacent C1 segment and assumed major slip junction of H1 and C1. We neglect a significant, but unknown proportion of dip slip assuming it makes a minor addition to moment
H2	**Hayward, north**	**6.9**	**210**	140	**9**	2	1.9	43	12	0	90	RL	2	Uniform model of north segment, see text. Slip from *Yu and Segall* [1996]; slip rate of *Lienkaemper and Borchardt* [1996]

code	fault or source name	M_w	t_e effective recurrence time, yr	seismic moment rate, 10^{15} Nm/yr	r slip rate mm/yr	±	d slip m	l length km	w km	h_t* km	dip °	fault type †	method ‡	summary
H3	**Rodgers Creek**	**7.0**	**230**	170	**9**	2	2.0	63	10	0	90	RL	4	South end after *Williams and others* [1997] Slip and recurrence from *Schwartz and others* [1993] and slip rate from Hayward fault zone
H4	**Maacama, south**	**6.9**	**220**	130	**9**	2	2.0	41	12	0	90	RL	2	North endpoint is major (15°) bend. Sources in this zone: H4, H5, H6 and H7 assume slip of ~2 m like slip on better known Hayward and Rodgers Creek fault segments
H5	**Maacama, central**	**7.1**	**220**	190	**9**	2	2.0	60	12	0	90	RL	2	North end gap and slight bend in *Jennings* [1992] mapping--tentative segment boundary. Creep rate in Ukiah 6.9 ± 1.4 mm/yr [*Galehouse*, 1995]
H6	**Maacama, north**	**7.1**	**220**	260	**9**	2	2.0	81	12	0	90	RL	2	Creep rate at Willits is 7.3 ± 0.7 mm/yr [*Galehouse*, 1995] North segment boundary (H. M. Kelsey, written commun., 1995) at end of mapped Quaternary faults on *Jennings* [1992] map and end of microseismic activity
H7	**Garberville-Briceland**	**6.9**	**220**	130	**9**	2	2.0	39	12	0	90	RL	2	NW end of the fault near the transitional Cascadian boundary. Microearthquakes deepen north of here. Geodetic data indicate dextral strain still high this far north (*Lisowski and Prescott* [1989]; M. H. Murray, unpub.data, 1996)
C1	**Southern Calaveras, creeping zone**	**6.2**	**60**	40	**15**	2	0.7	26	5	5	90	RL	5	130-km-long creeping zone has long-term slip rate similar to creep rate. Use 1984 Morgan Hill earthquake [*Oppenheimer and others*, 1990] as characteristic event
C2	**Northern Calaveras, entire**	**7.0**	**400**	90	**6**	2	1.9	52	13	0	90	RL	1	6 mm/yr rate on small geodetic net at Calaveras Reservoir [*Prescott and Lisowski*, 1983]; 5 mm/yr geologically [*Kelson and others*, 1996]. Maximum rate, north Calaveras fault system, 8 mm/yr near Covelo (see C7). *Oppenheimer and Lindh* [1993]
C2a	**No. Calaveras, Amador Valley**	**6.1**	**200**	8	**6**	2	0.3	15	13	0	90	RL	1	A M5.7 earthquake occurred in this area in 1864, but it could equally well have occurred on the Hayward or other flts. Mostly straight segment steps right at Sunol Valley. *Simpson and others* [1993], *Oppenheimer and Lindh* [1993]
C2b	**No. Calaveras, San Ramon Vy.**	**6.1**	**200**	8	**6**	2	0.3	13	13	0	90	RL	1	A rupture accompanying the M5.6 (±0.5), 1861 earthquake extended 13 km from present-day Elworthy Ranch [*Rogers and Halliday*, 1993] to Amador Valley. SE end matches a right-step at Dublin canyon. *Simpson and others* [1993], *Oppenheimer and Lindh* [1993]
C3	**Concord**	**6.5**	**240**	25	**6**	2	0.7	23	12	0	90	RL	1	Rate at depth assumed 6 mm/yr interpolated from Calaveras Reservoir geodetic net and Green Valley creep rate of *Galehouse* [1995] Preliminary minimum of 6 mm/yr [*Simpson and others*, 1995]

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C34	**Concord-Green Valley**	**6.9**	**330**	75	**6**	2	1.1	66	12	0	90	RL	1	Creep rate 3-6 mm/yr north of Calaveras Reservoir [*Galehouse*, 1995], but ~8 mm/yr near Covelo (C7) 1985-1989 (*Lisowski and Prescott*,1989; M. H. Murray, unpub. data, 1996)
C4	**Green Valley**	**6.7**	**330**	40	**6**	2	0.9	44	12	0	90	RL	1	Rate assumptions same as for northern Calaveras and Concord. North end based on change in strike and gap in seismicity
C5	**Hunting Creek-Berryessa**	**6.9**	**170**	130	**6**	3	1.0	60	12	0	90	RL	1	Segmentation determined by recognition of major changes in strike of surface faults and termination of microseismic zone
C6	**Bartlett Springs**	**7.1**	**230**	230	**6**	3	1.4	85	15	0	90	RL	1	Northward of this segment, surface-faulting is obscure or poorly known and microseismicity is much more diffuse. Fault may dip northeast [*Castillo and Ellsworth*, 1993]
C7	**Round Valley**	**6.8**	**170**	120	**6**	3	1.0	56	12	0	90	RL	1	Holocene traces obscure and low microseismicity. Trilateration 1985-1989 shows ~8 mm/yr creep rate near Covelo (*Lisowski and Prescott*, 1989; M. H. Murray, unpub. data, 1996)
C8	**Lake Mountain**	**6.7**	**150**	90	**6**	3	0.9	33	15	0	90	RL	1	Similar arguments and problems to Round Valley fault (Calaveras fault system) to SE and Garberville-Briceland fault zone (Hayward fault system) to the SW
GV01	**Great Valley_01**	**6.7**	**8300**	1	**0.1**	.05	0.8	44	10	7	15	R	1	Source centered on Sites anticline near Willows. MTJ slab active here below at 15~30 km depth. Coalinga (GV13) analog used (CAU), except rate is order of magnitude slower [*Unruh and others*, 1995]
GV02	**Great Valley_02**	**6.4**	**6000**	1	**0.1**	0.05	0.6	22	10	7	15	R	1	Centered on Cortina Thrust of *Unruh and others* [1995]. Coalinga analog used, except lower shortening rate similar to GV01
GV03	**Great Valley_03**	**6.8**	**620**	25	**1.5**	1	0.9	55	10	7	15	R	1	Geomorphic expression of Sweitzer and Dunnigan Hills faults suggests Holocene activity [*Unruh and Moores*, 1992]. Segment extends length of Rumsey Hills antiform. Coalinga analog used
GV04	**Great Valley_04**	**6.6**	**540**	19	**1.5**	1	0.8	42	10	7	15	R	1	Probable general source region of 1892 M~6.5 earthquake in Winters-Vacaville area, but details highly uncertain [*Unruh and Moores*, 1992] Coalinga analog used
GV05	**Great Valley_05**	**6.5**	**450**	13	**1.5**	1	0.7	28	10	7	15	R	1	Poorly understood but structurally distinct segment adjacent to lowest Coast Ranges and Montezuma Hills. May interact with possible surface faults: Vaca? [*Knuepfer*, 1977] and Pittsburg [*McCarthy and others*, 1995] with events to 28 km depth

code	**fault** or **source name**	$\mathbf{M_w}$	$\mathbf{t_e}$ effective recurrence time, yr	seismic moment rate, 10^{15} Nm/yr	**r** slip rate mm/yr	±	**d** slip m	**l** length km	**w** km	$\mathbf{h_t}$* km	dip °	fault type †	**method** ‡	summary
GV06	**Great Valley_06**	**6.7**	**560**	20	**1.5**	1	0.8	45	10	7	15	R	1	Segment associated with the greater Mount Diablo regional antiform. Midway fault uplift rates [*Clark and others,* 1984] consistent with Coalinga analog assumption
GV07	**Great Valley_07**	**6.7**	**560**	20	**1.5**	1	0.8	45	10	7	15	R	1	Segment parallels major folds and San Joaquin fault zone of *Lettis* [1982]. Late Quaternary uplift rate similar range to Coalinga [*Clark and others,* 1984; *Sowers and others*, 1993] CAU
GV08	**Great Valley_08**	**6.6**	**540**	18	**1.5**	1	0.8	41	10	7	15	R	1	Similar to GV07 and GV09, but hanging wall a major homoclinal segment. Right step in range front possible internal segment boundary [*Wakabayashi and Smith,* 1994] CAU
GV09	**Great Valley_09**	**6.6**	**520**	18	**1.5**	1	0.8	39	10	7	15	R	1	Distinct homoclinal segment bounded by San Joaquin fault (steep backthrust?) on northeast and Ortigalita (strike-slip) fault on southwest, and bedding slip on O'neill fault zone
GV10	**Great Valley_10**	**6.4**	**400**	10	**1.5**	1	0.6	22	10	7	15	R	1	Another distinct homoclinal segment, but no published evidence of Quaternary faulting and folding. Coalinga analog used (CAU)
GV11	**Great Valley_11**	**6.4**	**425**	11	**1.5**	1	0.6	25	10	7	15	R	1	Segment associated with NE-dipping flank of major anticline. Extent of likely earthquake (e.g., 1885 M~6.5) to SE difficult to predict because of curvature in structure. CAU
GV12	**Great Valley_12**	**6.3**	**360**	8	**1.5**	1	0.5	17	10	7	15	R	1	Northward continuation of Coalinga-New Idria NE flank, but no aftershocks here in 1983. Indistinct boundary to next segment, GV11. May be shorter [*Wakabayashi and Smith,* 1994] CAU
GV13	**Great Valley_13**	**6.5**	**460**	14	**1.5**	1	0.7	30	10	7	15	R	2	Coalinga 1983: moment, slip rate and slip model consistent with *Stein and Ekstrom* [1992]. Segment length from aftershock zone consistent with anticlinal and geomorphic segmentation
GV14	**Great Valley_14**	**6.4**	**400**	11	**1.5**	1	0.6	24	10	7	15	R	1	North Kettleman Hills segment, M 6.1 event in 1985, but area formula of *Wells and Coppersmith* [1994] gives M 6.4. Event had much less slip or rigidity is much lower than the Coalinga 1983 M6.5 event
L01	**Rinconada**	**7.3**	**1700**	57	**1**	1	1.6	190	10	0	90	RL	1	Late Cenozoic rates, 2-4 mm/yr [Hart and others, 1986], plate model allows 2 mm/yr, but geomorphic evidence suggests <1 mm/yr
L02	**Greenville**	**6.9**	**550**	48	**2**	1	1.1	73	11	0	90	RL	1	Greenville fault probably limited to ~10 km of slip since >5 Ma based on offset serpentinite body (<2 mm/yr) or slip possibly began 3.5 Ma (<3 mm/yr); Minimum rate [*Wright and others,* 1982]

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L03	**Ortigalita**	**6.9**	**1100**	22	**1**	0.5	1.1	66	11	0	90	RL	1	Detailed study [*Anderson and others*, 1982] depended mostly on soil dating for rates and recurrence conclusions. Shorter segments reasonable but in conflict with long recurrence. *La Forge and Lee* [1982]; *Clark and others* [1984]
L04	**Monterey Bay-Tularcitos**	**7.1**	**2600**	17	**0.5**	0.4	1.3	83	14	0	90	R-RL	1	Order of magnitude slip rate based on >1 m slip needed to recognize Holocene in offshore data and 10 m of Holocene offset not apparent onshore
L05	**West Napa**	**6.5**	**700**	9	**1**	1	0.7	30	10	0	90	RL	1	Slip rate based on recognizable Holocene geomorphic expressions and regional strain book-keeping---needs checking
L06	**Quien Sabe**	**6.4**	**600**	9	**1**	1	0.6	22	10	0	90	RL	1	Mb 5.2 (1986) may be typical event (D. H. Oppenheimer, written commun., 1995) Range of slip rate mainly judged from Holocene geomorphic features that appear distinct enough that larger, infrequent events might occur (W. A. Bryant, oral commun., 1996)
L07	**Monte Vista-Shannon**	**6.8**	**2400**	7	**0.4**	0.3	1.0	41	15	0	45	R	1	Length from *Jennings* [1992] map. Slip rates and dip (45 ± 5°) from Hitchcock and others [1994]. Mean width given as fault intersects San Andreas segments at a range of depths, maximum on A3 at 18 km and minimum on A2 at 3 km
L08	**Collayomi**	**6.5**	**1100**	5	**0.6**	0.3	0.7	29	10	0	90	RL	1	See also Big Valley fault in *Clark and others* [1984] for slip rate discussion. Segment is slightly longer than well-defined surface zone to reflect probable longer subsurface events
L09	**Point Reyes**	**6.8**	**3500**	5	**0.3**	0.2	1.1	47	12	0	50	R	1	1.4 km vertical slip on granite since late Miocene or after early Pliocene [*McCulloch*,1987]. Steep reverse to thrust at depth
L10	**Zayante-Vergeles**	**6.8**	**10000**	2	**0.1**	0.1	1.1	56	12	0	90	RL-R	1	Rake in trench ~55°, thus dip-slip > strike-slip [*Coppersmith*, 1979]. Dip, highly variable, to SW away from San Andreas. Slip rates of *Clark and others* [1984]. Vertical, strike-slip style dominates near south end (D. Oppenheimer, writ.comm.,1995)
NE01	**Honey Lake**	**6.9**	**600**	53	**2.5**	1	1.5	55	11	0	90	RL	3	Eastern branch of eastern Sierra Nevada-Great Basin (SNGB) dextral shear zone. Recurrence time and slip rate ~2 mm/yr of *Wills and Borchardt* [1993] on main trace; maximum rate from VLBI data (D. F. Argus, written commun., 1995); Nuvel-1A [*DeMets*, 1995]
NE02	**Mayfield-McArthur-Hat Creek**	**7.0**	**630**	63	**2**	1	1.3	95	11	0	65	N-RL	1	Assumes branches of SNGB dextral shear zone converge with combined rate less amount lost to Likely fault and areal source, NE12. Capable of event similar to 1954 Fairview Peak M7.1. Rates from: microplate model, *Muffler* [1994] and *Wills* [1991]

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NE03	**Gillem-Big Crack**	**6.6**	**750**	11	**1**	1	0.7	32	11	0	65	N-RL	1	Part of SNGB dextral shear assumed to be on Cedar Mtn fault system, some slip assumed to pass northward through Medicine Lake volcano aseismically, re-emerging on Gillem fault. No local slip vector data used
NE04	**Cedar Mtn**	**6.9**	**1100**	26	**1**	0.5	1.1	78	11	0	65	N-RL	1	No local control on rates from VLBI. Assume some of Hat Creek fault system slip passes northward through Medicine Lake Volcano to emerge on eastern margin of Klamath Lakes graben. Microplate model suggests 4-5 mm/yr RL across Klamath Lakes graben
NE05	**Surprise Valley**	**7.0**	**930**	37	**1.3**	1	1.2	87	11	0	60	N	1	Slip rate and dip from *Clark and others* [1984] and *Hedel* [1980]
NE06	**Likely**	**6.9**	**3500**	3	**0.3**	0.3	1.0	64	11	0	90	N-RL	1	Slip rate based on minor (<5 m?) offset to Lahontan-age shoreline on Madeline Plain by fault (W. A. Bryant, oral comm., 1996)
NE07	**Goose Lake**	**6.8**	**10000**	2	**0.1**	0.1	1.0	57	11	0	65	N	1	Rate from *Pezzopane* [1993]
NE08	**Battle Creek**	**6.5**	**1400**	5	**0.5**	0.4	0.7	29	11	0	75	N	1	Maximum slip rate and dip from *Clark and others* [1984]. Minimum rate from *Page and Renne* [1995]
NE09	**northeastern Calif., areal source**	**7.0**	**110**	160	**2**	1	1.2	240	11	0	90	N-RL	1	Length for whole zone. Mw, slip, area and recurrence for assumed largest event. Areal source polygon: -120.0 40.4, -121.5 40.4,-122.5 42.5, -120.5 42.5
NE10	**Mohawk-Honey Lake, areal source**	**7.1**	**690**	80	**2**	1	1.4	116	11	0	90	RL	1	Length for whole zone. Mw, slip, area and recurrence for assumed largest event. Areal source polygon: -120.0 40.4, -121.5 40.4, --121.19 39.84, -120.815 39.65, -120.5 39.5, -119.7 40.15
NE11	**Foothills fault zone, areal source**	**6.5**	**12500**	0.5	**.05**	.03	0.7	25	11	0	65	N	1	Float a M6.5 [*Schwartz and others*, 1996] Slip rate [*Clark and others*, 1984] Areal source polygon: -122.16 40.24, -121.865 40.37, -121.63 40.055, -121.19 39.84, -120.815 39.65, -120.7 38.395, -120.05 37.275, -120.78 38.08, -121.085 38.62, -121.13 38.84
NE12	**western Nevada, areal source**	**7.3**	**440**	260	**4**	2	1.8	200	11	0	90	RL	1	Length for whole zone. Mw, slip, area and recurrence for assumed largest event. Areal source polygon: -120.5, 39.5, -119.7, 40.15, -118.11 38.0, -119.15 38.0, -120.1 39.0

*$\mathbf{h_t}$, assumed depth to top of earthquake source †fault type: N, normal; R, reverse; RL, right-lateral ‡method, see Table A-2